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EXECUTIVE SUMMARY

Barriers and Incentives to Training

Prepared for the Expert Panel on Skills
by Graham Lowe and Kathryn McMullen
The Work Network of the Canadian Policy Research Networks

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Executive Summary

Barriers and Incentives to Training Graham Lowe and Kathryn McMullen, Canadian Policy Research Networks

Purpose

To review the Canadian literature on barriers and incentives for skills development within Canadian organizations.

Highlights

Definition and measurement

Skills are characteristics of both workers and jobs, and therefore should be viewed from both the supply and the demand sides of the labour market.

Work-related skills vary on two major axes: substantive complexity and decision- making autonomy. Researchers also have identified other dimensions of skill, such as know-how, problem solving, social interaction, fine and gross motor skills.

Informal knowledge possessed by workers, gained though experience or from co-workers, is an important yet unacknowledged source of skill in workplaces.

Training barriers are not insurmountable

Barriers are not immovable obstacles, but as weak links in the human resource development process, they can be overcome by workplace, labour market, and education and training policies.

Supply of skill does not necessarily increase demand

Human resource development policy that informs much of the discussion about adult education and training rests on the tenuous assumption that by increasing the supply of skilled workers, employers will naturally increase job skill requirements over time. This overlooks the process of credentialism, whereby employers simply raise entry-level requirements for jobs artificially.

Training barriers -- Organizational factors

Faced with poaching, employers may be reluctant to invest in training. This 'free rider' problem also can encourage the provision of only firm-specific skills through training.

Skill shortages in some sectors, such as high-technology design and manufacturing, have not led to the increased in-house training activity that one might predict. Rather, skill needs are being met through immigration.

- Lack of adequate accounting information on the costs and benefits of training tends to constrain employer investments in training. Firms that measure the impact of training on performance typically find that benefits outweigh costs. Employers also lack good information on their future training needs, where training is available outside the firm, and how to assess the quality of training.

- Firm size is a strong predictor of the incidence and frequency of training. Smaller firms train much less than large ones. The cost of training is the key barrier for small firms which are also more likely than larger ones to drop training if it is in place, and to evaluate the impact of training less favorably.

- The provision of training can be seen as one feature of a 'bundle' of innovative workplace organization and management practices. Firms with cost-based business strategies are far less likely to provide training.

Training Barriers: Labour market factors

- Employer decisions to invest in training also reflect conditions in the labour market from which they recruit. The tightness of the labour market affects worker turnover behaviour, which in turn influences training decisions by employers.

- A cluster of labour market trends raise concerns about future access to training for certain groups of workers. Workers whose labour market status or working conditions may limit access to training and further education include: own-account self employed; home-based; those in non-standard work arrangements such as temporary and contract, workers in long-hour jobs, and workers experiencing the stresses of balancing work and family responsibilities.

- One barrier to skilled trades training is the organization of apprenticeship systems and social values that are biased in favour of university education.

Training barriers – Individuals

- The concepts of a learning society and a knowledge-based economy and society are closely related. Both emphasize the importance of on-going education and training. Inequality in access to learning opportunities therefore becomes a major social policy concern.

- Participation in formal education and training is unevenly distributed across the adult population. Generally, this participation heavily favours those who already have a lot of human capital and who are in more advantaged labour market situations. The availability of employer-sponsored training is crucial in this respect.

- Psychological conditions such as trust and commitment influence how workers view training. There are signs that employment has become more tenuous and fragile, which may encourage workers to adopt a more individualistic orientation to training, putting their own interests foremost and focusing less on how training could improve current job performance.

- On the whole, Canadians have high levels of educational attainment. From the perspective of life-long learning, however, there are some unsettling signs. While full-time undergraduate university enrolment is steady, part-time enrolment among mainly older individuals has been dropping. Future post-secondary educational plans are strongly influenced by gender, age and marital and family status. Greater flexibility in programs and alternative delivery could make further education more accessible in these respects.

More training not always the answer

- Another way to think about the 'skills gap' is to examine the extent to which existing human capital is used in jobs. This shows that approximately one in four workers are overqualified, due to a mismatch between the skill requirements of their job and their education, training and experience.

- Informal learning is fairly widespread and is an important yet overlooked source of work-relevant skills. Assessing and acknowledging the contributions of informal learning could help tap this potential reserve of human capital.

Managerial Attitudes and the 'Learning Organization'

- The overriding determinant of training activity is the perception of a need to train and a commitment to training on the part of management. Firms where this commitment exists have a solid sense of the overall business strategy, have human resource development plans, make their commitment to training and skills development well-known to employees, and encourage the active participation of employees in their own skills development.

- Perhaps most importantly, management must hold a strong belief that training, employee involvement, motivation, accountability, and the ability to be self-managing are all critical ingredients of company success.

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Obstacles et incitatifs à la formation

Préparé pour le Groupe d'experts sur les compétences
par Graham Lowe et Kathryn McMullen
Réseau main-d'œuvre
Réseaux canadiens de recherche
en politiques publiques

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Sommaire

Obstacles et encouragements à la formation

Graham Lowe et Kathryn McMullen, Réseaux canadiens de recherche en politiques publiques

Objet

Examiner les études canadiennes sur les obstacles et les encouragements au développement des compétences dans les organisations canadiennes.

Faits saillants

Définition et mesure

Les compétences sont caractéristiques des travailleurs et des emplois et devraient donc être examinées du point de vue de l'offre et de la demande sur le marché du travail.

Les compétences professionnelles varient en fonction de deux grands pôles : la compexité de fond et l'autonomie dans la prise des décisions. Les chercheurs ont également dégagé d'autres dimensions des compétences, comme le savoir-faire, la résolution de problèmes, l'interaction sociale ainsi que la motricité fine et grossière.

Les connaissances informelles que possèdent les travailleurs et qu'ils ont acquises grâce à l'expérience ou auprès de collègues sont une source importance encore que non reconnue de compétences dans les milieux de travail.

Les obstacles à la formation ne sont pas insurmontables

Les obstacles ne sont pas insurmontables, mais puisqu'ils sont des maillons faibles du processus de développement des ressources humaines, ils peuvent être surmontés par le milieu de travail, le marché du travail ainsi que des politiques en matière d'éducation et de formation.

L'offre de compétences n'accroît pas nécessairement la demande

La politique de développement des ressources humaines qui sous-tend une grande partie des analyses sur l'éducation et la formation des adultes repose sur l'hypothèse ténue que si l'on accroît l'offre de travailleurs qualifiés, les employeurs rehausseront naturellement leurs exigences professionnelles avec le temps. Cette hypothèse ne tient pas compte de la diplômanie, qui fait que les employeurs rehaussent artificiellement les exigences relatives aux postes de débutants.

Obstacles à la formation – Facteurs organisationnels

- Face au maraudage, les employeurs peuvent hésiter à investir dans la formation. Ce problème de l'abstentionnisme peut aussi encourager la prestation de compétences propres à une entreprise grâce à la formation.

- Les pénuries de compétences dans certains secteurs, comme la conception et la fabrication de pointe, n'a pas provoqué la hausse de la formation interne qui avait été prévue. Les besoins de compétences sont plutôt comblés par l'immigration.

- La pénurie d'information comptable sur les coûts et les avantages de la formation a tendance à limiter les investissements des employeurs dans la formation. Les entreprises qui mesurent l'incidence de la formation sur le rendement constatent d'habitude que les avantages l'emportent sur les coûts. Les employeurs manquent aussi d'information fiable sur leurs besoins en formation futurs, sur les endroits où il est possible de trouver la formation à l'extérieur de l'entreprise et sur la façon d'évaluer la qualité de la formation.

- La taille de l'entreprise est un grand indicateur de l'incidence et de la fréquence de la formation. Les petites entreprises donnent beaucoup moins de formation que les grandes. Le coût de la formation est le principal obstacle pour les petites entreprises, qui sont également plus enclines que les grandes à abandonner la formation une fois qu'elle est en place et à évaluer moins favorablement l'incidence de la formation.

- La formation peut être considérée comme un élément d'un ensemble de pratiques d'organisation et de gestion du milieu de travail. Les entreprises dont les stratégies sont axées sur les coûts sont beaucoup moins enclines à offrir de la formation.

Obstacles à la formation – Facteurs du marché du travail

- Les décisions des employeurs d'investir dans la formation dépendent aussi de la conjoncture sur le marché du travail où ils recrutent leurs effectifs. La tension sur le marché du travail influe sur le roulement des travailleurs, ce qui, à son tour, influe sur les décisions de formation des employeurs.

- Une série de tendances sur le marché du travail soulèvent des inquiétudes quant à l'accès futur à la formation pour certains groupes de travailleurs. Les travailleurs dont la situation sur le marché du travail ou les conditions de travail limitent l'accès à la formation et aux études comprennent : les travailleurs autonomes; ceux qui travaillent à domicile, ceux dont les régimes de travail ne sont pas conventionnels, comme les travailleurs temporaires ou les contractuels, les travailleurs dont les emplois comportent de longues heures de travail et les travailleurs qui ont du mal à équilibrer les responsabilités professionnelles et familiales.

- Un obstacle à la formation dans des métiers spécialisés est l'organisation des régimes

d'apprentissage et les valeurs sociales qui témoignent d'un préjugé en faveur des études universitaires.

Obstacles à la formation – Les personnes

- Les notions de société de l'apprentissage et d'une économie du savoir sont intimement liées. Elles insistent toutes les deux sur l'importance de l'éducation et de la formation permanentes. L'inégalité de l'accès aux possibilités d'apprentissage devient donc une grande préoccupation de la politique sociale.

- La participation aux études et à la formation est répartie inégalement dans la population adulte. En règle générale, elle favorise largement ceux qui ont déjà un grand capital humain et qui sont plus avantagés sur le marché du travail. L'existence d'une formation parrainée par l'employeur est cruciale à cet égard.

- Des facteurs psychologiques comme la confiance et l'engagement influent sur la façon dont les travailleurs envisagent la formation. Des signes démontrent que l'emploi est devenu plus ténu et plus fragile, ce qui pourrait encourager les travailleurs à adopter une attitude plus individualiste face à la formation, à placer leurs propres intérêts au-dessus de tout et à insister moins sur la façon dont la formation pourrait améliorer le rendement dans leur emploi actuel.

- Dans l'ensemble, les Canadiens sont très instruits. Du point de vue de l'apprentissage continu, par contre, quelques signes sont inquiétants. Même si les inscriptions d'étudiants à plein temps dans les universités sont constantes, les inscriptions à temps partiel d'étudiants souvent plus âgés diminuent. Les plans d'études postsecondaires futures sont fortement influencés par le sexe, l'âge, l'état civil et la situation familiale. Une plus grande souplesse des programmes et la diversification des modes de prestation pourraient rendre la poursuite des études plus accessible à ces égards.

Une formation accrue n'est pas toujours la bonne solution

- Une autre façon d'envisager l'« écart de compétences » consiste à déterminer dans quelle mesure le capital humain existant est utilisé dans le travail. On découvre alors qu'environ un travailleur sur quatre est surqualifié, en raison du décalage qui existe entre les exigences professionnelles du poste et les études, la formation et l'expérience.

- L'apprentissage informel est assez répandu est constitue une source importante mais négligée de compétences pertinentes pour le travail. Évaluer et reconnaître les contributions de l'apprentissage informel pourrait contribuer à exploiter au maximum ce réservoir potentiel de capital humain.

Les attitudes de la direction et l'« organisation d'apprentissage »

- Le facteur déterminant de l'activité de formation est que la direction sente la nécessité de former les employés et qu'elle s'engage envers cette formation. Les entreprises où existe cet engagement ont une idée très précise de la stratégie d'affaires générale, elles ont des plans de perfectionnement des ressources humaines, elles font bien connaître à leurs employés leur engagement envers la formation et l'acquisition de nouvelles compétences et elles encouragent la participation active des employés à l'acquisition de compétences par eux-mêmes.

- Mais au-delà de tout cela, la direction doit être fermement convaincue que la formation, la participation des employés, la motivation, la responsabilisation et la capacité de s'autogérer sont des facteurs essentiels du succès de l'entreprise.

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Executive Summary

Skills – Definition and Measurement

Skills are characteristics of both workers and jobs, and therefore should be viewed from both the supply and the demand sides of the labour market. To fully understand the larger context in which supply and demand factors interact, it is useful to draw insights from psychological, sociological, organizational, and labour market research.

Work-related skills vary on two major axes: substantive complexity and decision- making autonomy. Researchers also have identified other dimensions of skill, such as know-how, problem solving, social interaction, fine and gross motor skills. While not based on empirical research, the concept of employability skills is beginning to be operationalized in specific contexts, such as university programs.

Informal knowledge possessed by workers, gained though experience or from co-workers, is an important yet unacknowledged source of skill in workplaces.

Training Barriers -- Organizational Factors

Barriers are not immovable obstacles, but as weak links in the human resource development process, they can be overcome by workplace, labour market, and education and training policies. Often barriers and incentives are polar ends of the same continuum.

Human resource development policy that informs much of the discussion about adult education and training rests on the tenuous assumption that by increasing the supply of skilled workers, employers will naturally increase job skill requirements over time. This overlooks the process of credentialism, whereby employers simply artificially raise entry-level requirements for jobs.

Faced with poaching, employers may be reluctant to invest in training. This 'free rider' problem also can encourage the provision of only firm-specific skills through training. There is a range of economic disincentives against the provision of general skills training by employers. However, increasingly it is difficult to distinguish between general and firm-specific skills, particularly in the areas of soft skills and technical skills.

Skill shortages in some sectors, such as high-technology design and manufacturing, have not led to the increased in-house training activity that one might predict. Rather, skill needs are being met through immigration.

Lack of adequate accounting information on the costs and benefits of training tends to constrain employer investments in training. Training therefore becomes an intangible. However, firms that measure the impact of training on performance typically find this to be positive. Employers also

lack good information on their future training needs, where training is available outside the firm, and how to assess the quality of that training.

Firm size is a strong predictor of the incidence and frequency of training. Smaller firms train much less than large ones. The cost of training is the key barrier for small firms. Smaller firms are also more likely than larger ones to drop training if it is in place, and to evaluate the impact of training less favorably.

The provision of training can be seen as one feature of a 'bundle' of innovative workplace organizational and management practices. Human resource development-intensive firms are strongly committed to training. This often is referred to as the 'high performance workplace' model. Firms with cost-based business strategies are far less likely to provide training. The introduction of work reorganization and new information technology also is associated with the provision of training. Workplace innovation, then, is a powerful incentive to training.

Training Barriers – Labour Market Factors

Employer decisions to invest in training also reflect conditions in the labour market from which they recruit. The tightness of the labour market affects worker turnover behaviour, which in turn influences training decisions by employers. However, the provision of training can signal stronger employer commitment, and this may encourage greater employee loyalty.

A cluster of labour market trends raise concerns about future access to training for certain groups of workers. Among those workers whose labour market status or working conditions may limit access to training and further education are the following: own-account self employed workers, home-based workers, workers in non-standard work arrangements, temporary and contract workers, workers in long-hour jobs, and workers experiencing the stresses of balancing work and family responsibilities.

One barrier to skilled trades training is the organization of apprenticeship systems and social values that are biased in favour of university education. Both schools and employers will need to invest more resources in apprenticeship programs for them to become a more attractive option for youth.

Training Barriers – Individuals

The concepts of a learning society and a knowledge-based economy and society are closely related. Both emphasize the importance of on-going education and training. Inequality in access to learning opportunities therefore becomes a major social policy concern.

Participation in formal education and training is unevenly distributed across the adult population. Generally, this participation heavily favours those who already have a lot of human capital and who are in more advantaged labour market situations. In short, those who could benefit most

from adult education and training are least likely to have access to it and therefore to participate in it. The availability of employer-sponsored training is crucial in this respect.

Psychological conditions such as trust and commitment influence how workers view training. There are signs that employment has become more tenuous and fragile, which may encourage workers to adopt a more individualistic orientation to training, putting their own interests foremost and focusing less on how training could improve current job performance. The decline of internal labour markets, where workers and employers mutually benefited from a long-term employment relationship, has contributed to this.

Another way of thinking about the 'skills gap' is to examine the extent to which existing human capital is utilized in jobs. This shows that approximately one in four workers are overqualified, due to a mismatch between the skill requirements of their job and their education, training and experience. This holds true for a range of core skills, particularly among the highly educated.

On the whole, Canadians have high levels of educational attainment. From the perspective of life-long learning, however, there are some unsettling signs. While full-time undergraduate university enrolment is steady, part-time enrolment – mainly older individuals – has been dropping. Future post-secondary educational plans are strongly influenced by gender, age and marital and family status. Greater flexibility in programs and alternative delivery could make further education more accessible in these respects.

Informal learning is fairly widespread and is an important yet overlooked source of work-relevant skills. Assessing and acknowledging the contributions of informal learning could help tap this potential reserve of human capital.

Managerial Attitudes and the 'Learning Organization'

The overriding determinant of training activity is the perception of a need to train and a commitment to training on the part of management. Firms where this commitment exists have a solid sense of the overall business strategy, have human resource development plans, make their commitment to training and skills development well-known to employees, and encourage the active participation of employees in their own skills development. This commitment to both training and to individual employees in turn acts as a signal to those employees, encouraging them to stay with the firm which then can reap the benefit of their training investments.

Perhaps most importantly, management must hold a strong belief that training, employee involvement, motivation, accountability, and the ability to be self-managing are all critical ingredients of company success. This positive attitude to learning and personal growth in turn will affect employee motivation and willingness to innovate, and, ultimately the overall dynamism of the firm.

Introduction

There has been long-standing concern in Canada over whether employers engage in enough employee training to ensure their survival and growth in a globalized, high-tech business environment. That concern has intensified as increasing numbers of employers in a wide variety of industries report skills shortages. Those shortages, real or perceived, raise important policy questions about the changing skill needs of industries and how the education and training system in Canada can respond appropriately.

This paper addresses these issues by summarizing key insights from a broad range of literature regarding barriers and incentives to adult education and training. The mandate of the Expert Panel on Skills is to examine skill needs, assess possible skill shortages, and identify steps needed to ensure the availability of workers with critical skills in five sectors – aerospace, automotive, biotechnology, environmental technologies, and information and telecommunications technologies. While much of the research reviewed below does not focus on these sectors *per se*, we identify organizational, labour market and individual characteristics that influence skill development activities in most industries. We further argue that the often imperfect and complex connections between supply and demand are crucial for understanding training barriers and incentives. We conclude by outlining an agenda for further study that will meet the information needs of the Expert Panel.

Training, Skills and Human Resource Development: Conceptual Issues

Defining and Measuring Skill

To begin, we will review the conceptual challenges of defining and measuring what adult education and training is intended to provide: skills, or more broadly, human resource development. These conceptual issues are rooted in distinct theoretical perspectives on what transformations in the nature of industrial society mean for skill. The labour process perspective (Braverman, 1974) views the application of bureaucracy and 'scientific management' as deskilling blue-collar and white-collar work. In contrast, post-industrial society theorists argued that a new economy relying heavily on highly-skilled 'knowledge workers' was taking shape (Bell, 1973). Other writers have associated flexible specialization and lean production with the growing demand for multi-skilled workers (Piore and Sabel, 1984).

These competing theories raise a host of definitional and measurement issues (see Spenner, 1983,1990; Form, 1987; Myles and Fawcett, 1990; Vallas, 1990; Gallie, 1994). Do skills reside in workers, are they job characteristics, or are they both? Can the skills, knowledge and abilities needed to perform specific tasks be reliably measured and ranked in terms of their importance and complexity? To what extent are aggregate increases in job skills accompanied by other improvements in the quality of work life?

Feminist scholars (Steinberg, 1990; Gaskell, 1991 Jenson, 1989) have pushed the discussion further, arguing that skills also can be thought of as socially constructed, reflecting the social status, power, and traditions of a particular occupation. This perspective questions to what extent formal job requirements indicate the skill levels of the work tasks performed. A related concept in this regard is tacit skill, a term describing the informal knowledge workers have gained through experience or from co-workers about how to do their job. Tacit skills obviously are not part of formal job descriptions and thus often go unrewarded.

Components of Skill

What are the components of a skilled job? The provision of training programs and learning opportunities depends very much on how one answers this question. For example, the Expert Panel has devised classifications of 'critical skills' that refer to generic skills, industry-specific skills, and specialized knowledge required in the five sectors. Given this approach, it is useful to reflect on the various classifications of skills provided in research literature.

There is consensus that work-related skills have two components: substantive complexity (the level and scope of intellectually, interpersonally, and manually challenging tasks performed in a job) and decision-making autonomy (the opportunity for individual workers to decide how, when, and how quickly to complete a task) (Clement and Miles, 1994: 74). Also, it is important to differentiate the type, breadth, and depth of skill. For example, McMullen's (1996) survey of workplace computerization found that *know-how skills* were more likely to be enhanced by the introduction of new technology than *problem-solving* and individual *decision-making* skills (autonomy).

The Conference Board of Canada's (CBC) Employability Skills Profile (ESP) has, at a practical level, influenced many employers' thinking (McLaughlin, 1992). However, the profile has not been validated by empirical research. Indeed, recently the CBC has cautioned that such an undertaking would be complex (Gilbert and Bloom, 1998). Prompted by the ESP, some post-secondary institutions have attempted to elaborate in comprehensive and nuanced terms how teaching and learning can further develop an advanced set of skills and abilities. To this end, the Faculty of Arts at the University of Alberta (Kitagawa, 1998) encourages the development of foundational intellectual capabilities (e.g., critical thinking), detailed subject area knowledge, and practical skills. These efforts coincide with greater emphasis within universities in particular on measuring 'educational outcomes' (e.g., Krahn and Lowe, 1997).

Computer Skills

Measuring computer-use skills is of relevance to the Expert Panel's five high-tech sectors, and in this regard the lack of consensus about the definition of computer literacy is noteworthy.

The term computer literacy is often used interchangeably with computer skills, technology literacy, and computer familiarity. The definition was originally based on the ability to program. However, for persons not trained in computer science, computer literacy typically means having

the ability to use a computer to fill their employment and personal needs (Paprzycki, et al., 1994). Any comprehensive definition of computer literacy would view it as skills, knowledge and attitudes that facilitate or inhibit the development of levels of efficacy with information technology. Indeed, computer literacy is more than just skills. Receptive attitudes about technology as a personal resource, and knowledge about technology's potential impacts are just as important.

The Broader Policy Context

The topic of barriers and incentives to training, and to learning, is a sub-set of human resource development policies. Such policies contribute to the larger goal of creating a knowledge-based economy and society. These policies assume that the acquisition of job-related education and training is necessary for social and economic advancement, but tend to focus on the supply of skilled workers. Human resource development policies pay less attention to the sources of demand for skilled workers, and say little about the need to reduce low-skilled work (Crouch, 1997).

The weak link in current human resource development policy, then, is the belief that eventually employers will notice the growing skills of the workforce and begin to utilize them. A major problem is the process of *credentialism*, whereby some employers tend to raise the bar on educational requirements, even though job content has not changed. Supply-side labour market policies are liken to a field of dreams: create the skilled workers, and employers offering skilled jobs will come (Bills, 1995). As Robert Reich's (1991: 3) describes the global economy: "Each nation's primary assets will be its citizen's skills and insights."

Organizational Influences on Training, Skill Development and Learning

Disincentives to Employer-Sponsored Training

Economic research on employer-sponsored training talks about barriers as "disincentives" (see Betcherman, Leckie and McMullen 1998). Employers may be reluctant to provide employees with training opportunities if they believe that they will not be able to recover the costs of training through higher employee productivity in the future. The term *externalities* refers the possibility that employees may leave the firm after training. A related term, *poaching*, refers to the fact that workers who have been provided with critical skills by one firm will be lured away. This deprives the employer who had invested in training of the gains from that investment, and the receiving firm becomes a "free rider."

According to this perspective, a complicated mélange of factors introduce considerable uncertainty into employers' training decisions. When weighing the possibility of losing a recipient of training, employers consider whether that training will be *general* or *firm-specific*. General training is seen as increasing the employee's wage bargaining power in the broader labour market. In theory, employers will be reluctant to sponsor this type of training. Firm-

specific training, in contrast, provides employees with skills that are relevant to their current employer. The employer's expectation that it will benefit from productivity gains, is seen as an inducement to finance the training.

In practice, however, it is difficult to distinguish between general and firm-specific training. This is especially so in the case of a number of high-tech sectors which share many common technical skill needs. It is even more difficult to distinguish when considering the softer skills like management, communications, and team-work skills. The sector profiles prepared for the Expert Panel document that many of the sectors under review face difficulties recruiting and retaining both workers with specialized technical skills and with soft skills. Concerned about losing workers whom they have trained, employers may be less inclined to make training investments if both hard and soft skills are in demand in a sector.

Inadequate information

Lack of adequate information also constrains employer investment in training (Betcherman et. al. 1998). This problem stems from the inability to measure either the costs or the benefits of training investments and poor information on the supply of training.

Studies that have tried to measure the costs and benefits of training document that firms generally fail to account for all of their expenditures on training and rarely assess the impacts of training on firm performance (Miller 1996). Only about one-third of Canadian employers track training expenditures and just over 40 per cent formally measure the impacts of training (Betcherman, Leckie and McMullen 1997). Wide variations in which training expenditures firms track prevent comparisons of training levels across firms.

This failure of firms to adequately measure either the size of their training investments or the performance impacts of training has major implications, particularly an overall underinvestment in training (Betcherman, Leckie and McMullen 1998). Faced with a choice between investing in tangibles, such as physical capital, with fairly predictable rates of return versus investing in human capital development, which has uncertain rates of return, firms tend to choose the former.

Firms also lack reliable information on their own training needs. Too often, planning for future human resource requirements is not integrated into firms' business strategies (Betcherman, McMullen, Leckie and Caron 1994). When faced with the decision to "make or buy" needed skills, coupled with immediate skill requirements, firms opt to hire workers with the needed skills needs rather than develop them in-house – possibly by poaching. This is especially the case for many of the highly specialized skills needed in high-tech sectors.

Moreover, it is difficult for employers to identifying training programs appropriate to their needs. The training-supply industry has grown rapidly over the past decade, presenting employers with a bewildering range of choices. Many employers face problems in identifying potential suppliers, evaluating what course content is required to meet skill requirements, and assessing the quality of training offered by private sector suppliers, but these problems are compounded for small firms. There is a need for stricter regulatory standards, greater accountability and accreditation standards, all of which could help employers make suitable choices.

Firm Size

A firm's size affects its behaviour in a variety of areas. With the growing contribution of small firms to economic growth and job creation, questions about size effect have assumed larger importance. While significant numbers of small firms are found in all industry sectors, they play a particularly large role in many of the emerging high-tech sectors.

Table 1 presents the size composition of firms by industry in 1997. In the manufacturing sector, 17 per cent of firms had fewer than 20 employees and another 30 per cent employed 20-99 people.[1] Almost one quarter of firms in transportation, communications and storage had fewer than 20 employees, as did 41.4 per cent of firms in business services. In both industries, about one-third of firms had 20-99 employees. Given the large number of relatively small firms in these sectors, it is clear that issues concerning training obstacles faced by small firms will be important.

[1] Davidman (1998) estimates that one-third of employees in the software industry are found in firms with 10 or fewer employees, noting that workers in the software industry are more likely than the average worker to be in a small firm.

Table 1: Size Distribution of Firms, by Industry Sector, Canada, 1997

	Less than 20 employees	20-99 employees	100-500 employees	500 or more employees	All sizes
	Percent				
Agriculture	75.5	19.1	4.9	0.0	100.0
Other primary	30.3	27.7	26.1	16.0	100.0
Manufacturing	16.8	30.1	33.9	19.2	100.0
Construction	60.9	29.4	7.5	2.1	100.0
Utilities	16.8	29.2	24.4	29.6	100.0
Transportation, storage, communications	24.2	31.0	26.6	18.3	100.0
Trade	48.3	33.7	15.6	2.4	100.0
Finance, insurance, real estate	36.9	34.6	17.1	11.4	100.0
Business services	41.5	32.4	19.1	7.0	100.0
Educational services	18.1	43.8	20.4	17.7	100.0
Health and social services	32.7	22.9	22.6	21.8	100.0
Accommodation and food services	49.3	40.4	8.7	1.6	100.0
Other services	62.6	25.2	8.4	3.8	100.0

Source: Based on Statistics Canada, Labour Force Survey, 1997.

The 1995 Workplace Training Survey examined how firm size influenced the amount of workplace training. Training costs on a per-employee basis were higher for small firms whereas large firms were able to take advantage of economies of scale in the provision of training (Betcherman, Leckie and McMullen 1997). Compared with large firms, small ones were more likely to cite the cost of training as an obstacle and to cite poaching as a disincentive, possibly because they are unable to match compensation levels in large firms. Larger firms were somewhat more likely to cite lost production time as a barrier to training. Both large and small establishments cited problems associated with insufficient government assistance and a lack of suitable training courses and trainers.

This study also provides a two-year (1993-1995) longitudinal analysis of firms' training behaviour. Among the establishments in this panel, the incidence of training fell from 71.8 per cent to 62.6 per cent (Betcherman, Leckie and McMullen 1997). Small establishments were the most likely to drop training. "Droppers" had evaluated their training much less favourably in 1993 in terms of quality, usefulness, and the level of support received from various stakeholders

in the organization. They also were less likely to have training planned, and less likely to characterize themselves as having progressive industrial relations. Among the "stayers," the level of training activity actually increased over the period. "Stayers" attached more importance to the role of skills in their business, reporting a closer connection between training and the "bottom line." For this group, technological innovation was a key strategic variable and "high performance" human resource practices in areas such as communications, work structures, decision making and compensation were more common in this group.

Workplace Innovations

Clearly, a range of organizational conditions influence training provision, or more generally, human resource development. Pursing the issue further takes us into the literature on workplace innovation, which suggests that instead of asking "what are the barriers and incentives to training?" the more appropriate question might be "what are the barriers and incentives to workplace innovations that support a training culture and high-skilled work?"

The pilot of the Workplace and Employee Survey (WES) offers useful insightful in this regard (Statistics Canada and HRCD, 1998). The WES pilot is limited, however, because it does not use a nationally representative sample, providing instead case studies of particular sectors or provinces. However, product-differentiated manufacturing (national), communcations and other utilities (national), science-based manufacturing (national), business services (Alberta), and scale-based manufacturing (Ontario) overlap to some extent with the Expert Panel's five strategic sectors.

To set the context, 1 in 5 of the 748 establishments surveyed viewed human resource strategies such as employee skill development and involvement, and improved labour-management relations, as being very important or crucial to their business. Some 13 percent said they were not at all important. Larger firms are more committed to human resource development (HRD). HRD-intensive firms also tended to have more flexible work arrangements and be more innovative organizationally.

In terms of training, 38 percent of establishments reported providing training and 35 percent offered vocational training in the 12 months leading up to the April 1996survey. Employers tended not to provide general training, such as literacy and numeracy, or training in team building, leadership, decision making, problem solving, and communications. Forms of work reorganization requiring training included teams, quality circles, and flexible job design. As well, training is correlated with compensation schemes such as productivity gain sharing and incentive pay.

Thus, employers with HRD-based business strategies were training intensive. Training does not happen in isolation from other innovative work organization and human resource practices. Establishments committed to training see it linked to larger productivity goals. Not only is training provision part of technological and organizational innovation, it also is linked to business strategies. The most training was provided by the 12 percent of establishments with product development or HRM as highly important in their business strategy. Cost-reduction business strategies were associated with a lower incidence of training.

These findings are suggestive, and together with WES employee survey data on training can provide a profile of the characteristics of intensive use of human resource management strategies – the critical variable, it seems, in training provision (see Table 2).

Table 2: Characteristics of establishments and workers associated with intensive use of human resource management strategies

ESTABLISHMENT CHARACTERISTICS	EMPLOYEE CHARACTERISTICS
Product oriented	Unionized
Use progressive approaches to organizing work	Promoted at least once
Offer formal vocational training	Receive formal appraisals
Provide a grievance procedure	Work flexible hours
More generous non-wage benefits	Participate in progressive work organization practices
Adopt alternative work arrangements	
Use formal performance appraisals	

Source: Statistics Canada (1998: 57-58)

Other major studies corroborate that training is 'bundled' with other HRM practices and organizational innovations. Thus, the provision of training is related to a cluster of environmental, organizational, and management strategy characteristics. (Betcherman et.al. 1994 Osterman, 1994, Betcherman, 1997). These studies raise the issue of causality, which is difficult to unravel given the reliance on cross-sectional data in virtually all studies. However, Osterman (1995) does show that training increases after introduction of organizational innovations, not the other way around. Given the implications this has for the development of training policy, clearly it demands further study.

Government has an important role to play in promoting workplace innovation. The federal government and some provincial governments have sponsored research on the ingredients of successful innovations (summarized in Lowe, forthcoming). This kind of information assists other organizations considering change strategies and presently is not communicated widely enough. Doing so would help to create conditions supportive of skill development. It may also be useful to examine European approaches to workplace innovation, which are more activist than those in Canadian (Commission of the European Communities, 1997).

Learning Organizations

Public policy has begun to promote the concept of lifelong learning as a means of ensuring that workers' skills are regularly updated and expanded (OECD, 1996). This is tied to the assumption that national economic prosperity depends on the growth of knowledge-based industries and jobs, which requires better-trained and educated workers. In the 1990s, then, 'training' has given way to 'learning'.

Lifelong learning requires shifting the emphasis in formal education from front-end loading – getting one's schooling when young – to a more open and flexible system that provides opportunities to obtain education throughout one's adult life. Internet-based instruction and virtual classrooms should, in theory, make it easier to access learning opportunities, provided a computer and tuition fees are affordable. But there's lifelong learning also means creating organizational environments which encourage on-going learning as part of one's job.

Advocates of lifelong learning and learning organizations often fail to recognize that the traditional design of many workplaces and jobs do not actively promote learning. Without addressing these organizational barriers, adult education and training policies intended to provide more lifelong learning will have limited success. Needed are incentives for employers to upgrade job skill requirements and give workers more latitude to acquire and apply new knowledge as part of doing their jobs (Maira and Scott-Morgan, 1997: 217). Managers in learning organizations must accept that workers must be empowered to make decisions about their jobs (Senge, 1990; Pfeffer, 1994). This requires changes not just in workplace structures, but in its culture as well (Schein, 1992; Hendry, 1996).

No consensus exists on how best to move organizations toward a learning model. It is evident, though, that learning requires a longer-term perspective on human resource development – a marked departure from the short-term focus of most current workplace training programs.

Implications of Changing Employment Relationships

Changes in the nature of employment relationships have implications for how workers view and respond to training. This raises important psychological issues that often get overlooked in the training literature.

In the 1990s, public opinion polls clearly show a pervasive 'economic anxiety' in response to restructuring , downsizing, and a fraying social safety net (Lowe, forthcoming; Betcherman and Lowe, 1997). A major impact of staff cuts or reorganization on the remaining staff is declining morale, loyalty, and job satisfaction (Murray Axmith & Associates 1997). Employers find it harder to motivate workers and gain commitment. Part of the problem is dwindling employment security, and employees are experiencing stress, overwork, difficulties making ends meet, and longer work hours (Angus Reid Group/Royal Bank, 1997).

What are the implications of employer-sponsored training in the context of increasingly fragile employment relationships? Employers are advised that workers need to feel "job ownership" and

"rewarded in a way than makes them feel deserved and appreciated" (Angus Reid Group/Royal Bank, 1997: 4). To compensate for reduced job security, some firms are providing more training opportunities, which may have unintended consequences. If workers feel less trust toward their employer, or if they worry about their economic security, their orientation to training may view training far more individualistically, looking for ways of improving their labour market position rather than doing their current job better. So far, research has not answered these questions, although CPRN's Changing Employment Relationships study is now examining them.

Labour Market Trends Affecting Training and Skill Development

Labour-market Conditions

Labour market conditions affect how employers view training investments. In a slack labour market where skilled employees are available, employers may be more likely to be willing to invest in training since they can expect to be able to retain the trained employee and benefit from their increased skills. However, in the tight labour market conditions that characterize many high-tech sectors today, highly-skilled employees can entertain a variety of employment options and employee mobility is high. Furthermore, the provision of training by an employer often indicates to employees that the employer is committed to them and willing to invest in their skill development. This can, in turn, have a positive effect on the employee's commitment to the firm and reduce turnover.

Core and Contingent Workers

This economic thinking mainly applies to core employees. Workers in a variety of 'nonstandard' arrangements, who now comprise one-third of the workforce, face greater difficulties accessing training. The concept of internal labour markets is an accepted explanation for why larger organizations are more training-intensive than smaller ones (Krahn and Lowe, 1998a: 125-6). This generalization also can be extended to the inequities in training access between core and non-core workers.

Rubery (1994) suggests that the growing distinction between core (internal labour market) and contingent (or non-standard) workers makes it useful to revisit why internal labour markets emerge. Competitive conditions, in which firms must compete in product quality and service standards in addition to price, enhance the value of an internal labour system for most employers. Internalizing labour allows for recovery of training costs, the ability to motivate employees over the long term and greater use of productive capacity. For employees, an internal system offers job security, promotion prospects and potentially higher earnings than would be available through the external 'open' market.

This relationship improves the performance of the firm and allows the employer to meet the demands of employees for secure interesting work while satisfying market demands. The likelihood of a particular employer adopting an internal labour market will also be affected by external labour market conditions. A shortage of workers with the general skills necessary for

particular work, and who can be trained on special skills required, would favour internalized labour, as would the behaviours of other employers seeking the same type of employee. To deal with poaching, employers would have to develop an employment relationship with a strong emphasis on employee retention – which moves well beyond the realm of training into working conditions and human resource management policies.

Self-employment

Self-employment is the leading labour market trend of the 1990s (Statistics Canada, 1997). Between 1989 and 1997, self-employment accounted for about 80 percent of total job growth in Canada (Statistics Canada, 1998). Most of the astonishing growth in self employment has been among the own-account self-employed, a group now comprising about 9 of all employment. The industries with highest self-employment rates are agriculture, personal and household services, construction, and business services (computer, accounting, advertising, engineering and management consulting). This latter category accounts for the lion's share of self-employment increases. Self-employed workers tend to be older than average and are among the most and least educated in the workforce.

Own-account self-employment now comprises 11 per cent of total employment (Table 3). One of the problems that has long plagued analysis of industry and employment trends in key high-tech sectors in Canada is that many of these industries do not fit neatly into the Standard Industrial Classification. This is a particular problem for the biotechnology, environment and information technology industries which, in fact, straddle a number of more traditional industry lines. The data on the percentage of workers by industry who are own-account self-employed can therefore give only an rough approximation of the extent to which such workers are found in the five industries under study. That being said, Table 3 does provide us with a sense of the extent of own-account self-employment within these industries.[2]

[2] Davidman (1998) cites data from Gower (1998) that shows that self-employment among computer programmers and analysts rose from 12 per cent in 1992 to 22 per cent in 1997. Within the software industry, self-employment grew by an average annual rate of 13 per cent from 1990 to 1996 and accounted for 30 per cent of employment in the industry in 1996. Job-tenure rates in the industry tend to be low.

Table 3: Percentage of Workers Who Are Own-Account Self-Employed, by Industry, 1997

	Percentage of Workers Who Are Own-Account Self-Employed, 1997
Agriculture	50.0
Other primary	11.1
Manufacturing	2.2
Construction	22.2
Utilities	0.0
Transportation, storage, communications	9.8
Trade	9.1
Finance, insurance and real estate	11.4
Business services	24.0
Educational services	2.8
Health and social services	6.0
Accommodation and food services	2.4
Other services	32.0
Public Administration	0.0
All industries	11.1

Source: Based on data from Statistics Canada, Labour Force Survey, 1997.

When investing in training, employers tend to focus on certain kinds of employees. A key characteristic is whether an employee is employed on a full-time basis and has established an attachment to the firm through tenure (Human Resources Development Canada and Statistics Canada 1997). Employees engaged on a contract or self-employed basis tend not to be candidates for employer-sponsored training since they are often employed on a project basis – a human resource management strategy that is increasingly prevalent in a number of high-tech sectors. The trend toward the use of own-account self-employed workers in these sectors is partly driven by employers who are seeking flexibility and "buying" specialized skills in the labour market only on an as-needed basis. But this trend is also being driven by workers who are also seeking flexibility and capitalizing on a market where they can sell their specialized skills to the highest bidder.

Consequently, there is no incentive for employers to invest in skills training for these kinds of workers. Instead, the onus falls on the individuals to ensure that their skills are current. This raises concerns about access to training and further education among the own-account self-

employed. The polarized character of the self-employed suggests that two distinct groups will have very different training needs, face different barriers, and therefore require unique policy responses. The low-income, lesser educated self-employed occupy a marginal location in the labour market, facing numerous financial and social barriers to training and education. In contrast, the 'knowledge workers' in business services, for example, may have the resources to obtain training, so for them, the challenge is to ensure that high quality training is available when needed, and delivery systems may be an important consideration.

Polarization in Work Hours

The increasing polarization of work hours presents a paradox in terms of access to training. On one hand, some workers have too few work hours and too little income to partake in further education or training. Yet this is the very group that needs it. On the other hand, an increasing number of workers put in 50 or more hours weekly, often managers and professionals. This group has high rates of training, yet may feel that it is just an added burden in their overloaded schedules. Also among the long work hours group are business owners, a group likely in considerable need of various types of ongoing formal training. In 1995, about 1 in 10 adult (25 years and older) employees usually put in 50 or more hours weekly (Statistics Canada, 1997). Coupled with this is the time shortages experienced by dual-earner parents, resulting in work-family conflict and stress (Frederick, 1995). These time pressures for a sizeable segment of the workforce could make training or education impossible, unless it is provided during paid work time.

The spread of alternative work arrangements prompts us to ask if this flexibility meets workers' needs for on-going formal learning opportunities. The traditional full-time, permanent, Monday-Friday job in a single employer's workplace is done by only 33 percent of workers. Temporary, long work hours, home-based or telework, flextime, part-time, weekend work, shift work, job sharing, multiple job holding, compressed work week and self-employment together are the new norm, accounting for two-thirds of all jobs in 1995 (Lipsett and Reesor, 1998). We simply do not know if training and education programs have adapted to these work schedules.

School-Work Transitions and Apprenticeships

A substantial barrier to developing an adequate supply of skilled trades workers is Canada's weak record of apprenticeship training. Apprenticeships are not viewed as a first choice by high school students, partly because high schools are geared toward advising university-bound students. Parents and school career counsellors tend to encourage the university route, even for students whose aptitudes and abilities may not be suited to this (Lowe et al., 1997). This reflects society's value system that has traditionally privileged white-collar jobs and post-secondary education.

So young people tend to stumble into apprenticeships well after leaving school. The average age of apprentices in Canada is 26 (Economic Council of Canada, 1992: 21). Furthermore, apprenticeship programs have high drop-out rates. Programs are expensive for both employers

and students. Some provinces, notably Alberta (RAPP, Careers, the Next Generation), have developed registered apprenticeship programs within the high school curriculum, providing students with credits toward the apprenticeship. These have some success, but are still on a small-scale. Successful school-work transition programs will require additional effort and resources from schools and employers in order to expand training opportunities for non-university bound youth..

Worker Characteristics Related to Training and Learning

Individual Correlates of Participation in Training

Patterns of participation in education and training are distributed very unevenly across the adult population. In part, this is due to biases exhibited by employers when making the decision to invest in training. But individuals also cite a number of they face personally when deciding to participate in training.

The most complete picture of these patterns is provided by Statistics Canada's 1994 Adult Education and Training Survey (AETS) which collected information on the programs and courses that Canadians had taken in 1993 (Human Resources Development Canada and Statistics Canada 1997). According to the AETS, 19 per cent of the labour force reported some employer-sponsored training. Most of that activity was job-related, being directed toward a current or future job. Much of that education and training -- 72 per cent -- was sponsored by employers. The following points summarize differences in individual participation in adult education and training, based on the results of the AETS:

- Participation increases with education, with university graduates being much more likely than those with high school completion or less than high school to participate in both employer-sponsored training and training their undertake on their own behalf;

- Employer-sponsored training increases with employee tenure; short-tenure employees have high participation rates for non-employer-sponsored training;

- Participation, whether employer-sponsored or not, increases with income;

- Participation in training first rises with age to the prime-aged group, then drops sharply for older age groups. This is particularly the case for employer-sponsored training, with workers between 35 and 44 years of age being almost twice as likely as those under age 25 to report employer-sponsored training. Participation in training is markedly lower for less-educated youth, especially with respect to training that is sponsored by employers.

Thus, a number of individual characteristics act as barriers to training. Employers in particular tend not to invest in skills development for younger workers, for individuals with a weak educational base, and for workers who do not have a long term attachment to the firm, focusing instead on more experienced, long-tenure employees who already have high education levels.

These findings are relevant for the five sectors being examined by the Expert Panel. Large parts of these sectors consist of workers with high education and skill levels, a characteristic that should encourage further investment in skills development by employers. However, in the context of a real or perceived skills shortage, a failure to invest in the skills development of younger workers represents a loss of a potentially rich resource. Many of the skills cited as being in short supply by the sector profiles prepared for the Expert Panel consist of "soft" skills such as management, communications, marketing, and team-work skills. By collectively focusing on a sub-set of workers that already has a great deal of skills and experience, they in a sense create a skills shortage that encourages these kinds of workers to become own-account self-employed. And, by hiring on a temporary, project basis, employers remove any incentive to the firm to invest in training, further reducing the size of the pool of skilled workers.

What this means is that many individuals who are motivated to increase their skills levels must invest in their own further education and training. But the AETS shows that they face their own barriers. These consist of barriers relating to the cost of training, presumably a barrier that will affect young adults who are still low on the earnings scale more than older workers. Time constraints are also a factor and one that will have a major impact on own-account self-employed workers who can clearly see the trade-off between time spent in training versus actively working. And just as in the case of employers, individuals also face significant barriers in terms of having information that allows them to identify the types of skills in which to invest, to locate appropriate training providers, and to assess the quality of those providers.

Factors Affecting Computer Literacy

Issues regarding the development of computer skills also are relevant for the Expert Panel. As with other skills, computer literacy is highly correlated with education, industry, occupation, and income. Attitudes towards computers differ between the genders (Sacks et al., 1993). Males tend to have more positive attitudes toward computers, while female attitudes become more positive as the level of familiarity with computers increases. Older individuals are slower to respond to rapid change in technology and increased reliance on computers than younger individuals (Linden and Adams, 1992). Families with children, particularly young children in school, are more likely to own computers . Geographic and rural versus urban place of residence also are correlates of computer literacy (Oderkirk, 1996). As well, cognitive ability and mechanical reasoning skills (Bill, 1997) positively correlate with acquisition of computer skills.

Viewing computer skills as only one of the skill sets necessary for a knowledge-based economy, this list underscores the need to take into account a variety of socio-economic, demographic, geographic, and personal attributes when formulating training policy. Identifying the specific combinations of factors that serve either as barriers or incentives (or perhaps more accurately, predictors of skill acquisition and use) require further attention from researchers.

Examining perceptions and attitudes more closely, it is noteworthy that Canadians see mainly positive effects of technological change on their jobs (Lowe, 1997). According to Angus Reid polls, two-thirds of the adults surveyed thought that technology will make life a bit easier in the future and many have high expectations that technology will improve work (Chidley, 1997;

Angus Reid Report, May/June 1996). One plausible explanation for this openness to information technology is that it often requires workers to develop new skills and knowledge).

In policy circles, there has been little discussion of the implications of these attitudes and perceptions for technological change and skill development. We do know, however, that computer courses are among the most common taken by workers to upgrade their skills for the future (Angus Reid/Royal Bank, 1997). Time and money are obvious barriers, given that many do these courses at their own expense and on their own time. Learning on one's own with the help of friends, coworkers, and family members is often an unacknowledged source of computer expertise in the workforce. Many Canadians are adapting to technological change, showing an interest in acquiring the requisite skills.

This discussion raises the possibility of what Zuboff (1988) calls 'informated work'. This describes work jobs in which workers can make decisions, take risks, and acquire the skills that enable them to make use of the information computers can generate. The key here is not the technology itself, but an approach to innovation that ensures workers are trained and able to use the new technology.

Formal Learning

Canada has one of the highest levels of educational attainment of any nation, with 40 percent of the population 15 years of age and over having graduated from university or another post-secondary institution, up from 29 percent in 1981 (Statistics Canada, *The Daily*, 14 April 1998). Canadians also have a strong 'education ethic', valuing education as a means to labour market success (Lowe, forthcoming).

However, recent university enrolment trends raise concerns about accessibility especially for adult learners (Statistics Canada, *The Daily*, 14 October 1998). After several decades of steady increase, undergraduate university enrolment has fallen since 1992-3. Much of the decline is in part-time undergraduates, especially those in older age groups. At a time that lifelong learning is being promoted, this is indeed a contrary trend. It is possible that this demographic group – who are in their prime working years but also likely feeling work-family conflict – may be reacting to these pressures. Other possible explanations are educational cutbacks, fewer part-time courses offered, or rising tuition. Whatever the reasons, they need further investigation if we are to understand barriers to lifelong learning.

The 1997 Alberta Graduate survey provides several useful insights about the factors influencing decisions to pursue further post-secondary education. Most of those who continued their education in the two-and-a-half years since graduating in 1994 did so on a full-time basis. However, full-time enrollment declined sharply among students who are over the age of 24, married, and have dependent children. Furthermore, female graduates and those who are younger, single, and do not have dependent children are somewhat more likely than their respective comparison groups to have plans for future education.

Informal Learning

Perhaps Canadians are relying more on self-learning. A recent study by the SSHRC-funded research network on New Approaches to Lifelong Learning (NALL) sheds new light on the informal learning activities of Canadians. This refers to learning that takes place outside organized educational courses, adding to a person's knowledge, skill, or understanding (NALL website).

Specifically, the national survey found that workers and the unemployed invest an average of six hours weekly in informal learning related to their current or expected employment. In most cases, this includes keeping up with the new information in their area, acquiring new computer skills, adding to their repertoire of specific job tasks, and developing problem solving and communication skills. Time devoted to informal learning varies by geographic region and social group. Unlike formal training, when it comes to informal learning activities, less-educated (in a formal sense) and low-paid workers are just as likely to engage in this as are professionals or managers.

There is a pent-up demand for enrolment in formal educational programs. However, in addition to time and costs, the stumbling block for the least educated is that their informal learning is not recognized by educational institutions. Moreover, employers don't acknowledge these self-taught skills either, mainly because they are difficult to assess. By assuming that a high school graduate is unskilled, as most employers nowadays do, overlooks how this person may have combined their basic education with personal interests and motivation to learn, creating advanced skill sets (Lowe and Krahn, 1995; Lowe, forthcoming). There is evidence that high school students, to take just one group, are developing useful work-relevant skills and knowledge through their voluntary activities (Lowe et al., 1997). This domain of skill development needs to be more fully explored.

Information Technology and Learning

A much broader policy perspective on technology and learning is provided by the federal government's Information Highway Advisory Council (IHAC) (Canadian Information Highway Advisory Council, 1995). The IHAC identifies job creation through technological innovation, universal and affordable access, and lifelong learning as cornerstones of an information society. The weak link in the design of the information highway is lifelong learning. The IHAC recommends: 'Learning and training comprise an integral part of the knowledge economy. Canada will provide an environment for lifelong learning in which all Canadians will have access to the widest possible variety of learning opportunities and tools in order to succeed in such an economy'(recommendation 14.1). But in practice, we are a long way from figuring out in practical terms how information technology can enable lifelong learning.

If we view information technology as an economic resource that enables human resource development, then inequality of access should be a policy concern. Household income is a key determinant of having computers, modems, cellular phones, and other tools of the information age. The computer penetration rate in the top household income quartile was four times the rate

in the bottom quartile. The gap for Internet usage is even greater. When income and education are combined, the divide widens (Dickinson and Sciadas, 1997). In terms of future training barriers, then, these access issues require careful consideration.

Matching Firms and Workers: Rethinking the 'Skills Gap'

A final issue we will examine is the extent to which workers' skills are actually used in workplaces. This is a problem of matching the supply of and demand for human capital. At a time when most high-tech sectors are expressing concerns about a 'skills gap', in the sense that their skill requirements exceed what is available in the labour market (either in quantity or quality), it is important to reflect on research that turns this notion of a gap on its head. Indeed, there is a diversity of evidence that workers skills often exceed the demands of their job.

Credentialism and Underemployment

Some employers use educational credentials as a pre-screening device in recruitment. This can result in the process of *credentialism*, to the extent that the credential required exceeds what the job actually requires. The 1997 Alberta Graduate Survey asked graduates from Alberta's four universities if a university degree was required when they were selected for their current job (Krahn and Lowe, 1997). Approximately two-thirds of nonstudents answered yes, with some interesting variations by occupation. At the undergraduate level, 64 percent of nonstudents were in jobs in 1997 that required a degree.

A related issue concerns the extent to which employers actually assess specific skills or educational qualifications when recruiting. At the entry level for high school graduates, employers tend to look for appropriate work-relevant attitudes (National Centre on Education and the Economy, 1990; Cappelli, 1992). This seems to contradict employers' frequent criticisms that high schools are not equipping students with relevant skills.

Credentialism contributes to the larger problem of underemployment. For example, Statistics Canada's 1994 General Social Survey reveals that over one in five employed non-students reported that their job did not require a high level of skill (Lowe, forthcoming). In terms of occupations, the large category of clerical, sales, and service jobs offers less opportunity to use skill than manual jobs. Furthermore, 40 percent of the workers who felt overqualified also reported low levels of job skill requirements. Not only are these sectors offering limited skill utilization opportunities, but this seems to go hand-in-hand with low investments in training. What is particularly interesting is that many of these workers hope to escape this low-skilled work by getting more education. Ironically, underutilization of skills in one's job is a powerful incentive to further develop one's human resources (Lowe, forthcoming).

Computer skills are advancing more rapidly than opportunities to use computers. Between 1989 and 1994, computer literacy (being able to perform work-related computer applications) increased from 59 percent to 68 percent of all workers (Lowe, 1997). These abilities exceed their use in workplaces. In 1994, just under half of workers used a computer in their jobs, a marked

increase from 35 percent five years earlier. There is scope for more knowledge-intensive work using computers, but many jobs just aren't designed to take advantage of this.

The 1997 Alberta Graduate Survey examines in more depth how the skill content of jobs is a barrier to the use and further development of human resources (Krahn and Lowe, 1997). The survey asked about the use of specific skills in graduates' current job, skills that the universities believe are important learning outcomes. On six skills – speaking, writing, problem solving, creative thinking, computers, and information management – overqualified graduates felt less challenged compared to those who were not overqualified. While these relationships vary by field of study and gender, it seems that conditions in specific industries and occupations are determinant. In short, demand as reflected in actual task content strongly shapes skill use.

Information Technology and Skill

There is growing concern about what individuals and businesses can do to make information technology an enabling resource (e.g., McMullen, 1996; Lafleur and Lok, 1997; Lowe, forthcoming). The paradox of workplace technology is that the more sophisticated the hardware and software, the more that worker's skills and abilities are the active ingredients in making the technology function. Thus, technology can be enabling for workers, in the sense that it calls for more skill, discretion, creativity, and learning on the job. For employers, too, these conditions pay off in harnessing more productivity from technology.

The Conference Board, for example, is critical of Canada and other industrial nations for underestimating the importance of overcoming two major barriers to successful information technology implementation. These are: the quality, skill and flexibility of the labour force; and difficulties many firms have adapting organizational structures and processes to the introduction and effective use of technology (Lafleur and Lok, 1997: 16).
Barriers imbedded in working conditions and organizational structures can make it difficult for individuals to access and use technology.

A survey by the Angus Reid Group for the Canadian Advanced Technology Association found that close to nine out of ten Canadian high-tech companies faced a skills shortage, with half having unfilled job openings (CATA/Angus Reid Group, 1997). The main response to this skill shortage has been to recruit offshore, even though few firms felt the quality of foreign workers was better than that of Canadian workers. However, the survey suggests that other options are available, but were not being pursued to anywhere near the same extent (Lowe, forthcoming). Only forty percent of advanced technology companies have programs in place to retrain current employees to move into advanced technology jobs. Given skill shortages that could extend several years, it is noteworthy that high-tech firms are not doing more to develop these skills in house, especially given the high levels of general education in the Canadian workforce.

Literacy Skills

Despite the on-going debates about how to define and measure employability skills, there is a consensus that literacy is the foundation on which other essential abilities rest (Lowe, forthcoming). Increasingly, governments are linking literacy, workforce skills, and lifelong learning. The knowledge and skill requirements of jobs are increasing. Furthermore, in a rapidly changing labour market, workers must be increasingly flexible and adaptable, engaging in lifelong learning. As the OECD puts it, literacy 'is the *sine qua non* of workplace learning' (Tuijnman, 1995: 22).

There is no doubt that literacy (measured in the IALS on prose, document and numeracy scales) is a powerful predictor of labour market success. Risk of unemployment, occupational status, income, economic security are highly correlated with one's literacy skills (Jones, 1995). So too is participation in life-long learning. Literacy, then, is both an enabler and an impediment to learning.

Using Literacy Skills in Workplaces

Policies to address literacy have focused almost exclusively on individuals with the lowest literacy levels. The 1994 IALS shows that approximately one in six workers have low literacy skills and are performing unskilled jobs (Krahn and Lowe, 1998b). Typically, these are older workers, males, or workers with less than high school education. Furthermore, very few workers with low inadequate literacy are in jobs that require higher literacy skills (one in twenty workers in terms of document literacy, and slightly more than one in ten with regard to quantitative literacy). Clearly, there is a need to upgrade low literacy skills. But if this literacy enhancement strategy is pursued, then it also makes perfect sense to upgrade the skill content of the jobs occupied by these workers. Otherwise, these workers will soon find that their jobs do not permit the use of their newly acquired literacy skills (Lowe, forthcoming).

However, far more widespread was a literacy skills mismatch in which workers' literacy levels exceeded the literacy requirements of their job. More than one in five workers are in jobs that underutilize their literacy skills. This means that the literacy requirements in a worker's job are two or more levels lower than his or her literacy level. Technicians and semi-professionals have the highest chance of being in the literacy surplus category; one in five professionals also have a surplus of document literacy. There also is a literacy surplus among workers in skilled and unskilled blue-collar occupations, which contrasts with claims about skill shortages in these areas of the labour force. These IALS findings also raise the possibility that if workers do not make use of their literacy skills, they could lose these skills over time (Krahn and Lowe, 1998b).

The literacy skill requirements of these jobs should, at least according to literacy experts, be a powerful motivator for these Canadian workers to upgrade their skills (Lowe, forthcoming). But there's another perspective. Research on literacy in lesser-industrialized nations suggests that 'literacy skill is demand driven,' in the sense that the need for these skills is low then incentives are lacking for workers to improve these skills (Jones, 1995: 105). Acquiring further education or training is not a good investment because there will not be labour market rewards for this. This

logic of learned helplessness likely operates among some Canadian workers who feel trapped in low skilled jobs. So unlike the large numbers of other workers who see skill up-grading as an escape route from dull jobs, this may not be the case for the least literate workers in the least skilled jobs.

The 'Learning Organization'

This paper has been broad-ranging in its review of skill shifts and factors relating to the provision of training by Canadian employers. In this section, we distill the lessons that apply more specifically to the five sectors that are the focus of the Expert Panel on Skills.

We begin by noting that, in some key respects, these sectors are not necessarily typical of all Canadian industry. First, these sectors are technology-intensive, both from the perspective of using technology as well as developing it. Second, they draw on a variety of specialized scientific and technological fields to produce a range of high-tech products and services. Third, some of them, especially the environment sector and biotechnology, are still young industries populated by a relatively small number of research-based firms that are struggling to grow beyond the start-up stage. Each of these unique features brings a requirement for workers who have a range of highly specialized skills – scientific, technical, and managerial.

The five sectors under study show some significant differences in organizational structure that make generalizations regarding training and skill development difficult. Perhaps most importantly, the automotive and aerospace sectors are well-established industries, populated by relatively large firms, whereas the environment and biotechnology sectors are new industries, with a large number of small firms; the information technology sector falls somewhere between these extremes, with a mix of larger, scale-based manufacturing and a range of research-based firms and producers of software services. Research has found that firm size is an important factor affecting firms' ability to train. Further, research also suggests that firm size plays a key role in affecting firms' human resource management (HRM) practices more broadly. On balance, it is the combination of HRM practices, of which training behaviour is one element, that will affect a firm's ability to meet its human resource and skill requirements. And it is here, where the impact of (small) firm size and HRM practices connect to form a set of special circumstances that affect the training behaviour of firms.

First, consider the role of firm size. As noted earlier, firm size is a strong predictor of the incidence and frequency of training. Smaller firms train much less than large ones. A key factor affecting this outcome is that training costs per employee appear to be higher for small firms, whereas larger firms appear to realize economies of scale in the provision of training. These economies arise from the ability to deliver the same training to several employees at the same time, whereas smaller firms are much more likely to have only one or two workers for whom a specific type of training would be useful. Larger firms are also more likely to realize economies in the identification of information on training sources and training providers.

Second, by the nature of their size, small firms are less likely to be able to offer career paths to employees. A career path is such that the skills of new, young recruits can be developed over a

period of time by moving into successively more advanced positions with a labour market that is internal to a firm. Small firms, in facing barriers that make it difficult to "grow" skills in house, resort instead to "buying" the skills they need. The "buying" of skills is reflected in different kinds of behaviour. One of these is to "poach" experienced workers from other firms. That in turn has the effect of discouraging firms from investing in skills development for their workers because they are afraid that those workers will be attracted away from other firms, causing them to lose their initial investment in training. A second response to the need to "buy" skills is to engage workers on a per project, contract basis. Experienced workers thus become part of a pool of highly specialized workers with no long-term attachment to a single employer. The research evidence shows, however, that employers are very unlikely to invest in the skills development of workers who do not have a long-term attachment to the firm. The onus for maintaining state-of-art skills is therefore on the independent workers in the pool of specialized workers. But these workers themselves face constraints in maintaining their training levels – constraints relating to time available to them to train and information on where best to go to get training.

While the special circumstances faced by small high-tech firms relating to their size, the cost of training, and the difficulties they face in "growing" skills in house present challenges to skill acquisition, the evidence is that these are not absolute barriers. A number of case studies that were undertaken as part of Canadian Policy Research Network's project on training for the new economy show that attitudes to training, especially managerial attitudes, play a crucial role in determining how much training is undertaken by firms (Betcherman, Leckie and McMullen 1997). No one firm size, nor one industry for that matter, has a monopoly on strong managerial attitudes in support of training.

In summarizing the insights gained by conducting a number of case studies, Betcherman, Leckie and McMullen describe the following types of firms and training behaviours:

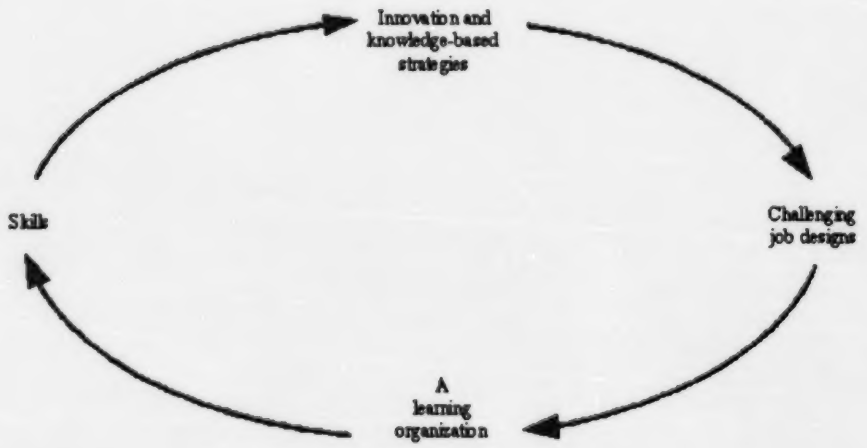
- incidental learning, but no formal investment – firms in which informal, or incidental, learning takes place on the job;
- event-triggered training – sporadic training events, undertaken in response to a specific stimulus such as the introduction of a new technology; and
- learning organizations – firms characterized by continuous formal and informal training, where a "learning environment" has become an integral and explicit part of the corporate culture.

Firms of all types – traditional and high-tech, large, medium and small – could be found in all three groups. In fact, a key conclusion reached by the authors was that no one problem stands out as being a truly significant obstacle to training. Instead, the overriding determinant of training activity is the perception of a need to train and a commitment to training on the part of management. Firms where this commitment exists have a solid sense of the overall business strategy, have human resource development plans, make their commitment to training and skills development well-known to employees, and encourage the active participation of employees in their own skills development. This commitment to both training and to individual employees in turn acts as signal to those employees, encouraging them to stay with the firm which then can reap the benefit of their training investments.

The bottom line is that, if Canadian firms continue to follow current practices, the apparent shortage of skilled and experienced workers will persist. In essence, by not adopting human resource management practices that integrate human resource development with business strategy, employers will continue to be in a position where they are competing for the same small pool of skilled workers. Adoption of the high-performance practices of learning organizations means that employers must institutionalize training in the firm. This means adopting formal practices including, setting aside a training budget, engaging in formal needs assessment, and evaluating training outcomes. In such firms, employees are encouraged to work toward accreditation, which may not necessarily be linked to their current job in the company. Perhaps most importantly, management must hold a strong belief that training, employee involvement, motivation, accountability, and the ability to be self-managing are all critical ingredients of company success. This positive attitude to learning and personal growth in turn will affect employee motivation and willingness to innovate, and, ultimately the overall dynamism of the firm.

The interplay of these factors ultimately results in a 'virtuous circle' linking skills and challenging job designs to the innovation and knowledge-based strategies that are characteristic of learning organizations (see Figure 1).

Figure 1 Creating Virtuous Circles: Labour Force Skills Drive Business Strategy



Source: Betcherman, Gordon, Kathryn McMullen, and Katie Davidman (1998). *Training for the New Economy*, Ottawa: Canadian Policy Research Networks.

A Policy Research Agenda

Our review of the research on barriers and incentives to adult education and training has identified a number of gaps in our understanding of this issue. From the above discussion the following questions emerge, which could guide further research relevant for the Expert Panel:

1. From the perspective of both individual workers and employers, what general and specific skills are needed in the five sectors immediately, and in the medium (2 to 4 years) and longer (5 or more years) term?

2. To what extent does the 'social construction' of skill in a sector, or its constituent firms, pose a barrier to women gaining entry to the sector?

3. What particular skills, knowledge and abilities already existing in the workforce were acquired from educational and training programs that were not geared to the specific needs of the five sectors, but that nevertheless could be a foundation for industry-specific training programs to address present and future labour shortages? In other words, what incentives are needed to encourage employers to utilize and adapt existing human capital to their needs?

4. To what extent do attitudes, both from the employers' perspective in recruiting, and the employees' perspective in making career and learning decisions, affect the flow of skilled labour in and out of the five sectors?

5. Are the educational and training requirements for jobs in areas of labour shortages an accurate reflection of the actual skill requirements of these jobs – in other words, to what extent is there a process of credentialism operating in firms within the sectors?

6. What market, organizational, and management factors explain why some firms have overcome the apparent obstacles of poaching and externalities, while others have not?

7. To what extent do firms in the five sectors measure the impact of the training programs they offer, especially on firm performance, and how is this information factored into decisions about future training provision?

8. To what extent is incomplete information about the supply of training and education programs available a barrier to skill development in each of the sectors?

9. What training delivery methods would be most cost effective for small firms in the five sectors, addressing their possibly unique training needs?

10. Do firms that provide intensive and extensive training opportunities in the five sectors also engage in the broad range of innovative workplace practices identified in the research literature? Is there a model of a 'high performance workplace' within each sector, and how do such firms assess the benefits of this bundle of innovations?

11. How are high performance workplace practices in firms within each sector related to positive outcomes for both employers (productivity, innovation) and workers (improved job quality)?

12. What are the barriers and incentives to workplace innovations that support a training culture and high skilled work in the five sectors?

13. To what extent do labour market trends such as own-account self-employment, other forms of non-standard work, home-based work, long work hours, and work-family balancing pressures make it difficult for workers to access needed training in the five sectors? What training models would be appropriate to meet the training needs of these groups?

14. Are apprenticeship programs in the five sectors achieving their potential in terms of recruiting young people into areas of skilled-trade shortages, present and anticipated? If not, what adjustments are needed to these programs?

15. Does the use of information technology within firms in the sectors provide on-going opportunities for skill development and learning. If not, what kinds of organizational changes would be required to meet this goal?

16. To what extent are there gaps in workers' computer literacy and the use of these skills in jobs?

17. What does a 'learning organization' look like in each of the five sectors? What are the factors accounting for firms successfully moving in this direction?

18. What demographic, socio-economic and other personal characteristics of workers in the five sectors, or within the potential pool of recruits outside, are associated with 'life-long learning' behaviours? Conversely, which specific groups of workers face obstacles (e.g., low literacy) to accessing or otherwise benefiting from training, and how could these obstacles be overcome?

19. Within firms, do employment relationship characteristics such as trust, commitment, and loyalty influence training provision and impact? Have changes to internal labour markets in firms affected training provision?

20. Have employers in the five sectors designed jobs in ways that fully utilize the skills, knowledge, and abilities of the workers who perform those jobs?

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